Name: Date:

Polynomial Factoring solution (version 42)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 38 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(38)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 152}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-8}}{2}$$

$$x = \frac{-12 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 2\sqrt{2}\, i}{2}$$

$$x = -6 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 3i$ and $5 - 8i$ in standard form $(a + bi)$.**

Solution

$$(2 - 3i) \cdot (5 - 8i)$$

$$10 - 16i - 15i + 24i^2$$

$$10 - 16i - 15i - 24$$

$$10 - 24 - 16i - 15i$$

$$-14 - 31i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 9x - 18$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	2	-9	-18
3		3	15	18
	1	5	6	0

$$f(x) = (x-3)(x^2+5x+6)$$

$$f(x) = (x-3)(x+2)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)\cdot(x+1)^2\cdot(x-3)\cdot(x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.